

PILOT

Plotter commands

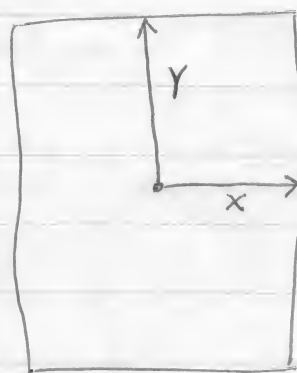
Pilot graphics commands: DRAW, TURN, DRAWTO, TURNTO, GO, GO TO
PEN UP, PEN DOWN, HOME, NORTH
PEN BLACK, BLUE, GREEN, or RED
= 0 1 2 3

All other standard PILOT commands are ignored.

New commands:

- * SCALE X, Y - creates a window $2X$ by $2Y$ units, with X and Y units the same physical size and as large as possible within the confines of the plotting paper. Home is the middle of this area, North is toward the top. The default scale is 79, 47 like the default PILOT screen window (~~with~~ but without a left window).
- * SIZE N, $0 \leq N \leq 63$ determines the size (scale) of letters plotted, default size is 1 (=40 dm/row)
- * WRITE or CH PLOT or CH DRAW or something: string
~~formatted like T~~ plots characters starting where pen is in direction = nearest 90° turtle direction. Characters that would fall out of the plotting area are not plotted but turtle position moves over one character width. After printing turtle direction is unchanged but turtle position has moved over so that 2 successive plots appear as though the strings were concatenated.

This correctly interprets variables, and ^{imbedded} ~~cursor~~ command. Imbedded clear screen is ignored



New Commands (cont.)

PLOTTER ON (OFF) sets default scale, ^{and size} scrolls
paper _{units} to create plotting room, moves pen to HOME, NORTH,
PEN UP, PEN BLACK.

Now program accessible internal variables:

pen X position > in units set by scale
pen Y position

char. width > for current size in units set by
char. height current scale.

Questions: How do you scroll to a new page/screen? CLEAR?
What happens if you print a CR? (when you are writing vertically?)
ignore it?

HOME

NORTH

SCALE

<exp>

"Goto 0,0"

"Turnto 0"

"Stretches" coordinate system by multiplying the scale factor times each x,y coordinate or relative move

$x = -240, 239$ $y = -999, 999$
(maintain x,y if all the paper, but don't plot) (clip?)
(Coordinate system has 0,0 in center of the paper)

SIZE

<exp> (1/64)

Determines the size of letters plotted (size increases linearly)

CHPLOT

<text expression>

Plots characters starting where pen is in direction equal to nearest 90° turtle direction. Characters that would fall out of the plotting area are not plotted, but turtle position moves over one character width. After printing, turtle direction is unchanged, but turtle position has moved over so that two successive plots appear as though the strings were concatenated.

If SCALE > 1, then on next plot, move if necessary in current direction to next (x,y)

LOTTER

ON/OFF

Sets SCALE=1, SIZE=1, HOME, NORTH, PPEN UP, PPEN BLACK, DASH 0

PPEN

UP/DOWN/BLACK/BLUE/GREEN/RED / <exp>

<exp> 0 = BLACK, 1 = BLUE, 2 = GREEN, 3 = RED

% X / %XP / %XT

X position of platter on, else turtle / X position of platter / X position of turtle

% Y / %YP / %YT

Y " " " " "

Returns "scaled" position of next plot position (see "adjustment" in CHPLOT)

% CW

Character width of current SIZE "Scaled" to [INT]

% CH

Character height

DASH

<exp>

$\phi/15$ Dashed line factor ($\phi = \text{solid}$)

X AXIS

<exp>, <exp>

"distance" between scale marks (scaled), # of scale marks

Y AXIS

<exp>, <exp>

"

"

ATARI 1020 PRINTER

First of all, open the printer:

```
OPEN #1,8,0,"P:"
```

To get into GRAPHICS mode:

```
PRINT #1;"(ESC) (ESC) CTRL G"
```

To return to TEXT mode:

```
PRINT #1;"A"
```

THE FOLLOWING COMMANDS ARE GIVEN FROM THE TEXT MODE

To get 20 characters per line:

```
PRINT #1;"(ESC) (ESC) CTRL P"
```

To get 80 characters per line:

```
PRINT #1;"(ESC) (ESC) CTRL S"
```

To get back to 40 characters per line:

```
PRINT #1;"(ESC) (ESC) CTRL N"
```

To change the SCALE of the letters:

```
PRINT #1,"S(a value from 0 to 63)"  
(0 is small, 63 is huge)
```

To access the INTERNATIONAL character set:

```
PRINT #1;"(ESC) (ESC) CTRL W"
```

To return to the STANDARD character set:

```
PRINT #1;"(ESC) (ESC) CTRL X"
```


THE FOLLOWING COMMANDS ARE GIVEN FROM THE GRAPHICS MODE

To return the pen to the HOME position:

```
PRINT #1;"H"
```

To specify the pen COLOR:

```
PRINT #1;"C(a value from 0 to 3)
(0=black, 1=blue, 2=green, 3=red)
```

To specify the LINE TYPE:

```
PRINT #1;"L(a number from 0 to 15)
(0 is a solid line, 15 is dots, and 7 is dashes)
```

To INITIALIZE the printer, or set the current position as 0,0:

```
PRINT #1;"I"
```

To DRAW to a specific point:

```
PRINT #1;"Dx,y"
(x is a value from 0 to 480, and y is from -999 to 999)
```

To DRAW RELATIVE to your current position:

```
PRINT #1;"Jx,y"
(x and y are the same as for DRAW)
```

To MOVE to a specific point:

```
PRINT #1;"Mx,y"
```

To MOVE RELATIVE to your current position:

```
PRINT #1;"Rx,y"
```

To draw a Y AXIS:

```
PRINT #1;"X0, distance between tics, number of tics"
```

Plotter Commands for PILOT II

The plotter should react to the following Pilot graphics commands: DRAW, TURN, DRAWTO, TURNTO, GO, GOTO, PEN UP, PEN DOWN, HOME, NORTH, ~~PEN BLACK~~, ~~PEN BLUE~~, ~~PEN GREEN~~, ~~PEN RED~~.

All other standard PILOT commands are ignored by the plotter.

New Commands:

SCALE X,Y -- creates a window 2X by 2Y units, with X and Y units the same physical size and as large as possible within the confines of the plotting paper. (0,0) is at the center of the plotting paper which is the location of HOME. NORTH is towards the top. The default scale is (79,47) like the default PILOT screen window (but without a text window).

SIZE N -- $0 \leq N \leq 63$. Determines the size (scale) of letters plotted. Default size is 1 (40 chars per row).

WRITE or CHPLOT or CHDRAW -- plots characters starting where pen is in direction equal to nearest 90° turtle direction. Characters that would fall out of the plotting area are not plotted, but turtle position moves over one character width. After printing, turtle direction is unchanged, but turtle position has moved over so that two successive plots appear as though the strings were concatenated. This command should correctly interpret variables and embedded cursor control characters. Embedded clear screen is ignored.

PLOTTER ON (OFF) -- sets default scale and size. Scrolls paper Y units to create plotting room. Moves pen to HOME facing NORTH with PEN UP and PEN BLACK.

PEN

Accessible Plotter Variables:

1. pen X position and pen Y position in units set by scale.
2. char width and height for current pen size in units set by current scale.

Questions:

1. How do you scroll to a new page/screen? CLEAR?
2. What happens if you print a carriage return? Don't forget you may be writing vertically. Ignore it?

Also FILL FILLTO } act like DRAW + GO

Also, PPEN - UP - DOWN

THE ATARI 1020™ COLOR PRINTER

OWNERS GUIDE



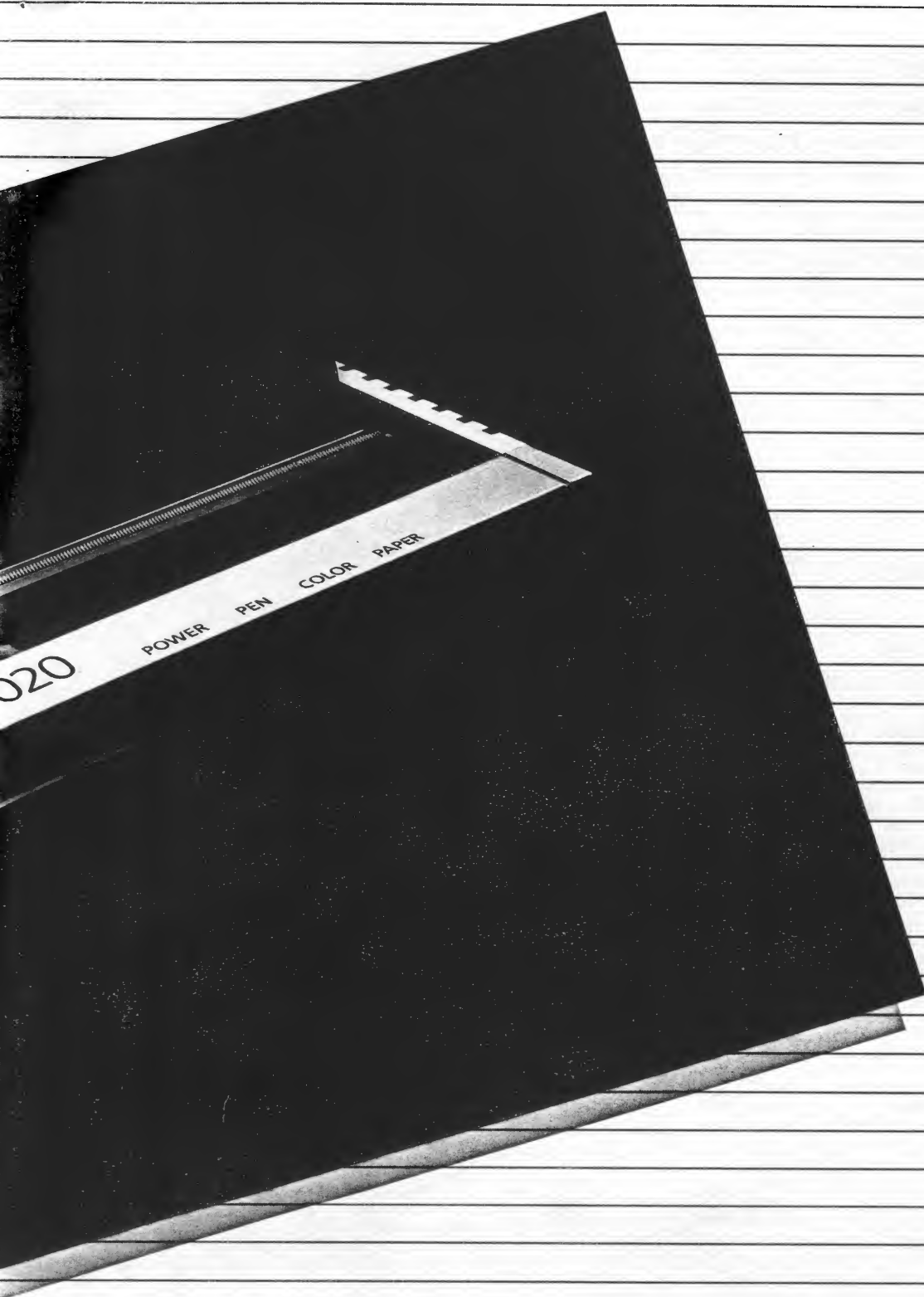
PRINTS GRAPHICS AND TEXT
FOUR VIBRANT COLORS
64 CHARACTER SIZES

ATARI

Now that you've purchased the ATARI® 1020™ Color Printer, you'll find it a versatile accessory to your ATARI Home Computer system. Whether you want to print charts or graphs for business and school reports, vibrant color graphic designs, text in various sizes or international characters, your new 1020 Color Printer is adaptable to your needs.

Read through the next few pages to see how to set up your printer and get it running. You'll learn how easy it is to operate and how much it can do. Then turn to the back of this guide and try out the sample programs provided to get you started.





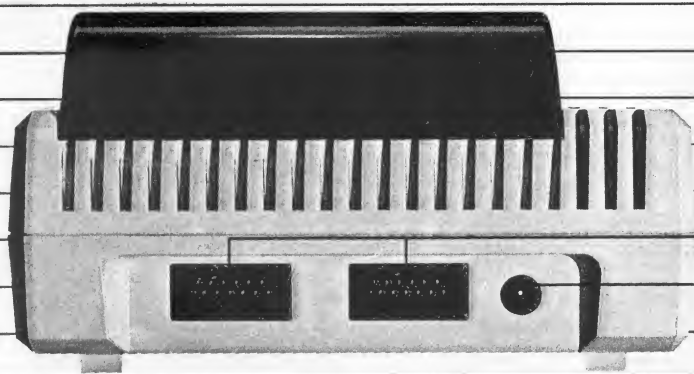
520

POWER

PEN

COLOR

PAPER



INPUT/OUTPUT PORTS

POWER IN

Your ATARI 1020 Color Printer package contains the printer, a connecting data cord for your ATARI Home Computer, a power cord with an adapter, two sets of the four standard color pens, and a warranty registration card.

The features of your ATARI 1020 Color Printer are shown here. You'll find explanations of these features and instructions for their use on pages 6—19 of this guide.

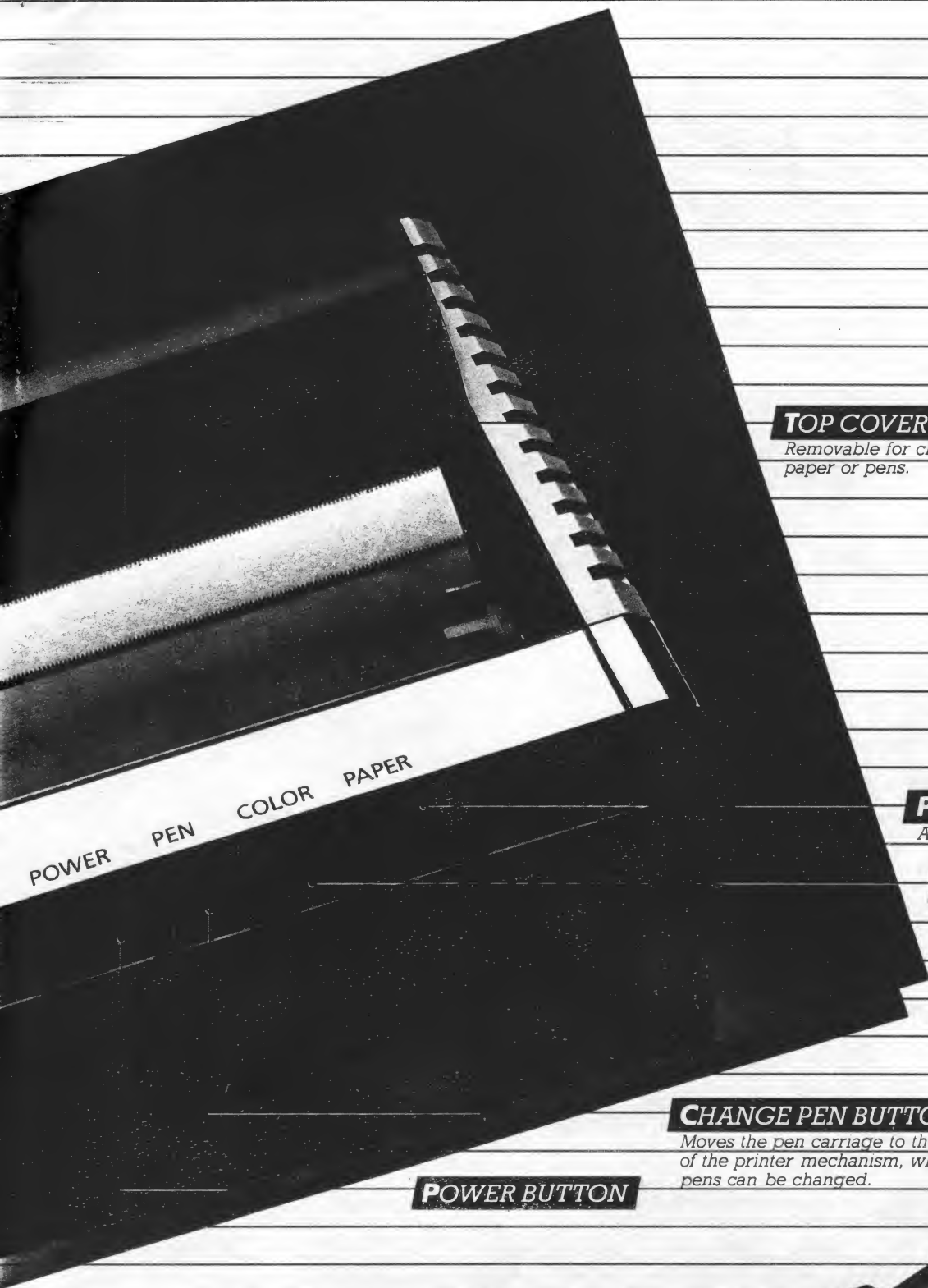
PEN CARRIAGE

Holds the four color pens.

POWER-ON LIGHT

Lights up when the printer is on.

ATARI 1020



TOP COVER

Removable for changing paper or pens.

PAPER FEED BUTTON

Advances the paper.

CHANGE COLOR BUTTON

Rotates the pen carriage to select the color pen to be used.

CHANGE PEN BUTTON

Moves the pen carriage to the right side of the printer mechanism, where pens can be changed.

POWER BUTTON

INPUT/OUTPUT DATA CORD

POWER CORD

GETTING STARTED

1 Make sure that all the parts of your ATARI Home Computer system are turned off before connecting your ATARI 1020 Color Printer.

2 Plug the smaller end of the power cord into the hole marked PWR on the back of the printer. Insert the AC power cord (with the AC adapter attached) in a wall socket.



3 Plug one end of the input/output data cord into the connector marked PERIPHERAL on your ATARI Home Computer.

4 Plug the other end of the input/output data cord into the 13-pin connector at the rear of your printer.



LOADING THE PAPER

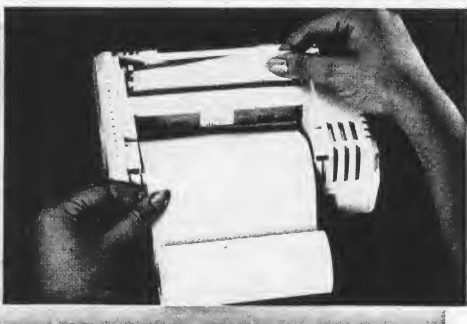
1 Lift off the printer cover.



2 Lift the paper holder out of its slots and place a roll of paper on the paper holder. Place the roll of paper behind the printer before loading. Trim the leading edge of the paper so that it's clean and straight. Make sure the paper roll is oriented so the paper feeds from the bottom of the roll.



Feed the leading edge of the paper into the metal slot at the bottom of the paper well.



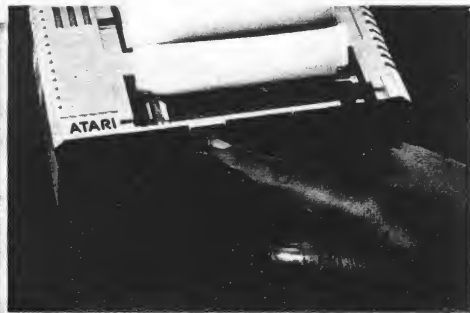
3 Gently turn the paper roller toward you until the paper appears. Make sure that the paper slides under the two brass pinch rollers as it turns. Unless the paper is under the pinch rollers, it won't feed properly during operation.



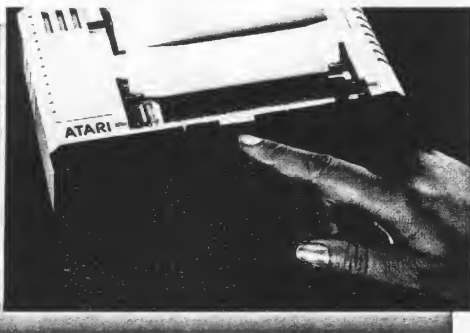
LOADING THE FOUR COLOR PENS

1 Lift off the printer cover.

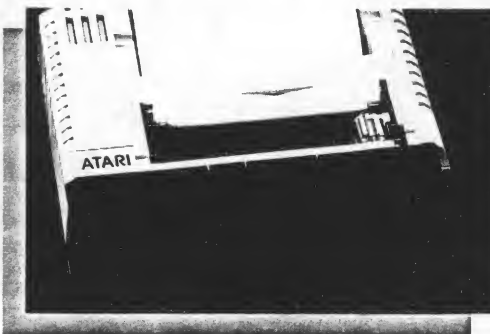
2 Press the POWER button to turn on the printer. The Power-On light comes on and the printer automatically begins the motions of printing a test pattern.



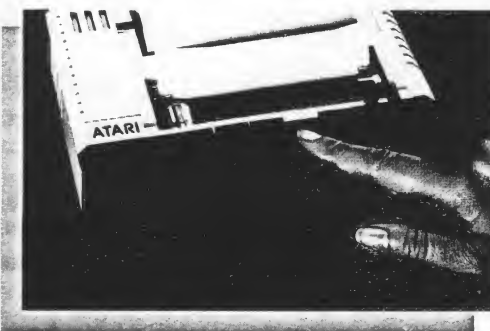
3 When the test pattern operation has stopped, press the CHANGE PEN button. (Note that if the PEN button is held down for longer than three seconds, the pen carriage returns to the HOME position and prints the four-square test pattern.) The pen carriage moves to the CHANGE PEN position.



4 The silver wheel at the end of the pen carriage next to the paper indicates which color pen to insert in each pen slot. Remove the protective cap from the pen and gently slide it into the carriage slot until it snaps into place. Be sure that the tip of the pen is inserted in the hole in the silver wheel.

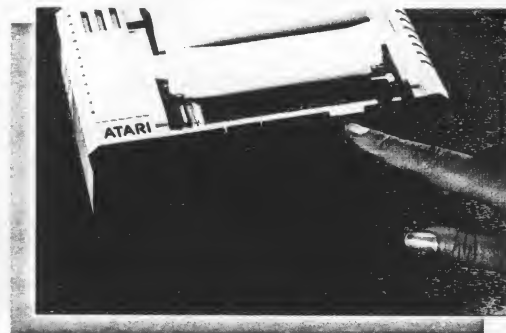


5 When the first pen is in place, press the COLOR button on the printer. The pen carriage returns to the HOME position and rotates to the next pen slot, then moves back to the CHANGE PEN position. Insert the next color pen as indicated on the silver wheel.

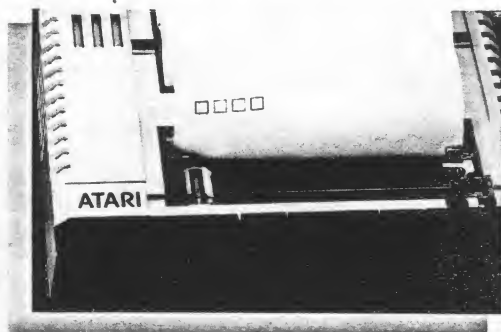


6 Repeat the procedure until all the pens are loaded.

7 After you've finished loading all the pens, press the PAPER button to return the pen carriage to the HOME position.



8 Press the POWER button to turn off the printer, then press it again to turn the power back on. The printer will print the test pattern. If the pens are loaded properly, the printer will draw four squares, one for each color.



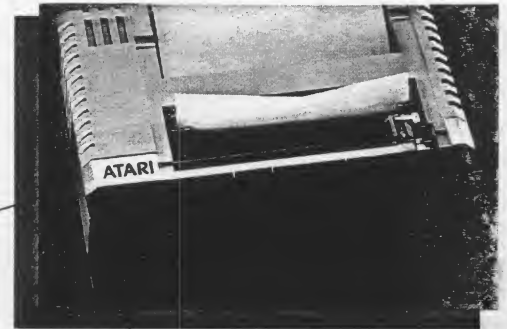
CHANGING THE PENS

Each time you turn on your printer, it automatically prints a test pattern consisting of four squares, one for each of the four pens. The purpose of the test pattern is to determine that the printer is working correctly, and to show the condition of each of the pens. If you find that any color ink is faded, it's time to replace that pen as described below.

1 Lift off the printer cover and press the POWER button to turn on the printer. The Power-On light comes on.

2 Press the CHANGE PEN button on your printer. The pen carriage moves to the CHANGE PEN position. (Note that if the PEN button is held down for longer than three seconds, the pen carriage returns to the HOME position and prints the four-square test pattern.) Press the CHANGE COLOR button to rotate the pen carriage to the color pen that needs to be changed.

3 Gently pull the knurled white plastic pen change lever toward you. The pen in the slot pops up. Remove the old pen and replace it with a new one by gently snapping it into the pen slot.



4 When the new pen has been inserted, press the COLOR button to rotate the pen carriage to any other pen that needs to be changed, and repeat step 3.

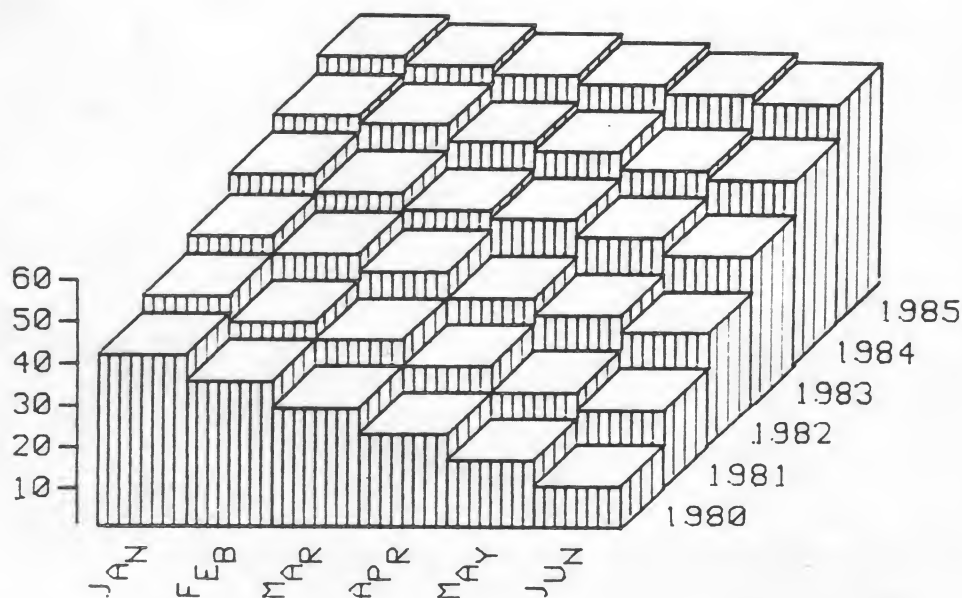
5 After you've finished changing the pens, press the PAPER button to return the pen carriage to the HOME position and resume normal operation.

OPERATING YOUR ATARI 1020 COLOR PRINTER

The ATARI 1020 Color Printer can perform 13 different operations, some in the TEXT mode and some in the GRAPHICS mode. You can try your hand at computer art or create tables, charts or diagrams for those important reports. Highlight those same reports with headings or labels printed in any of 64 different sizes. Or draw X and Y axes with scale marks for easily readable graphs.

Before trying these operations, be sure to:

- 1** Turn on your television.
- 2** Insert an ATARI BASIC program cartridge in the cartridge slot in your ATARI Home Computer (the left cartridge slot on the ATARI 800™ Home Computer).
- 3** When the READY prompt appears, press the POWER button on your printer to turn it on. The printer begins the automatic test pattern.



HOW TO ENTER TEXT & GRAPHICS MODES

The ATARI 1020 Color Printer works in two modes, a TEXT mode and a GRAPHICS mode.

Before you can carry out any operations with the printer, you have to command your computer to "open" the printing device. To open the printer, type:

OPEN #(and a value from 1 to 7),8,0,"P:"

You can enter any value from 1 to 7 after the number symbol (#), but the value must be consistent throughout all the commands that you enter for any single program. For the purposes of explanation, this guide uses the value 2 in all sample operations commands discussed. After you've opened the printer, enter the GRAPHICS mode by typing:

PR.#;" ESC ESC CTRL G

(For CTRL G, press CTRL while typing G.)

Programmer Note: If you PRINT a LIST of commands for a program you've created, the GRAPHICS mode sequence will be printed like this:

PR.#;" " "

To return to the TEXT mode from the GRAPHICS mode, type:

PR.#;" A "

OPERATIONS WITHIN THE TEXT MODE

CHARACTER WIDTHS

Your ATARI 1020 Color Printer allows you to print in 20, 40, and 80 character-per-column widths. Different character widths can be used for labeling and distinguishing among different types of data or parts of diagrams.

Unless you specify the width you want, the printer will automatically print text in 40 characters per column.

To have the printer type 20-characters per column, type:

PR.#2;"ESC ESC CTRL P"

(For CTRL P, press CTRL while typing P.)

To change to 80 characters per column, feature type:

PR.#2;"ESC ESC CTRL S"

(For CTRL S, press CTRL while typing S.)

To return to 40 characters per column, type:

PR.#2;"ESC ESC CTRL N"

(For CTRL N, press CTRL while typing N.)

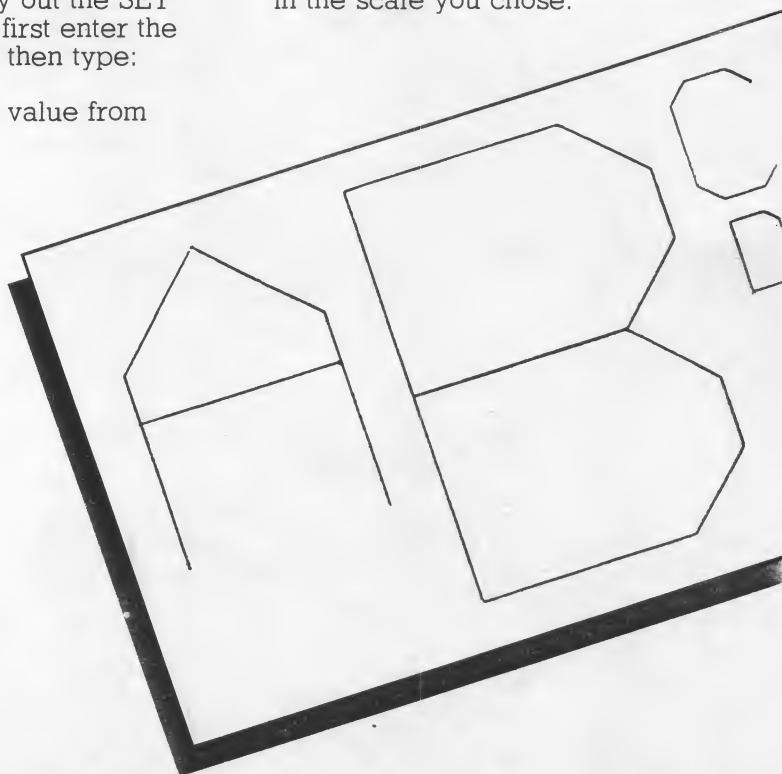
90 COLUMNS PER LINE 80 COLUMNS PER LINE 80 COLUMNS PER LINE 80 COLUMNS PER LINE
40 COLUMNS PER LINE 40 COLUMNS PER LINE 40 COLUMNS PER LINE
20 COLUMNS IN A LINE

SET CHARACTER SCALE

You can print characters in 64 different sizes with the SET SCALE operation. To carry out the SET SCALE operation, first enter the GRAPHICS mode; then type:

PR.#2;"S(and a value from 0 to 63)"

Finally, return to the TEXT mode. Any text you enter will be printed in the scale you chose.



INTERNATIONAL CHARACTERS

In general, the characters you type on the computer keyboard are what your ATARI 1027 prints. There are exceptions, however, that allow you to print useful characters that are not on the keyboard.

When using BASIC, you may print international characters by entering this short program:

```
10 OPEN #2,8,0,"P:"
20 PR.#2;"ESC ESC CTRL W"
```

To stop printing international characters while you're in BASIC, type:

```
PR.#2;"ESC ESC CTRL X"
```

A	À
B	Ñ
C	É
D	Ç
E	Ô
F	Ò
G	Ì
H	Ê
I	Î
J	Ü
K	Ä
L	Ö
M	Ú
N	Ó
O	Ö
P	Û
Q	Â
R	Û
S	Î
T	É
U	È
V	Ñ
W	Ê
X	Â
Y	À
Z	Ä

OPERATIONS WITHIN THE GRAPHICS MODE

HOME AND CHANGE COLOR

The pen carriage will return to the HOME position when you type:

PR.#2;"H"

The command that tells the printer to change the color of the pen to be used is:

PR.#2;"C(and a value from 0 to 3)"

These commands are useful when you're writing a program that uses a combination of the printer's capabilities.

LINE TYPE

Your 1020 Color Printer will draw either solid lines or dotted lines; the dots can be of various lengths. This operation can be particularly useful in printing mechanical drawings or geometric figures. Unless you tell the printer to draw a dotted line, it will automatically draw a solid one. To have the printer make a dotted line, type:

PR.#2;"L(and a value from 1 to 15)"

To return to printing a solid line, type:

PR.#2;"LO

DRAW

Given this command, your printer will draw a line (solid or dotted) from the coordinates 0,0 to any values you enter for X and Y. You can make clear, precise charts, tables or graphs with this operation. Combine it with other operations to make interesting graphic patterns.

The values for X can be from 0 to 480; the values for Y can be from -999 to 999. The command for the DRAW operation is:

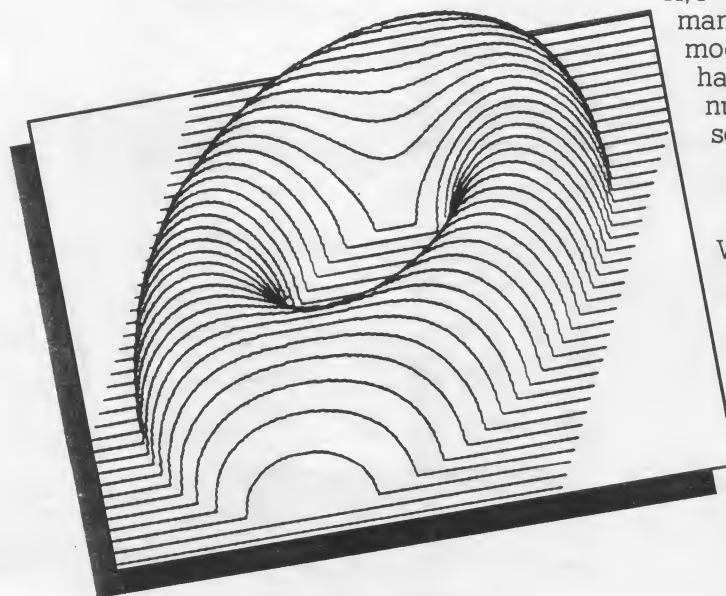
PR.#2;"DX,Y"

By entering a string of several X,Y values for a DRAW command (or any other GRAPHICS mode command), you can have the printer execute a number of operations consecutively. For example:

PR.#2;"DX,Y;X,Y;X,Y;X,Y;"

When you enter several different commands together in a string, you must type an asterisk (*) between successive commands. For example:

PR. #2; "DX,Y*MX,Y*JX,Y"



INITIALIZE

To initialize the printer—that is, to tell it to regard the current position of the pen as the coordinates 0,0 in carrying out subsequent operations—type:

PR.#2;"I"

RELATIVE DRAW

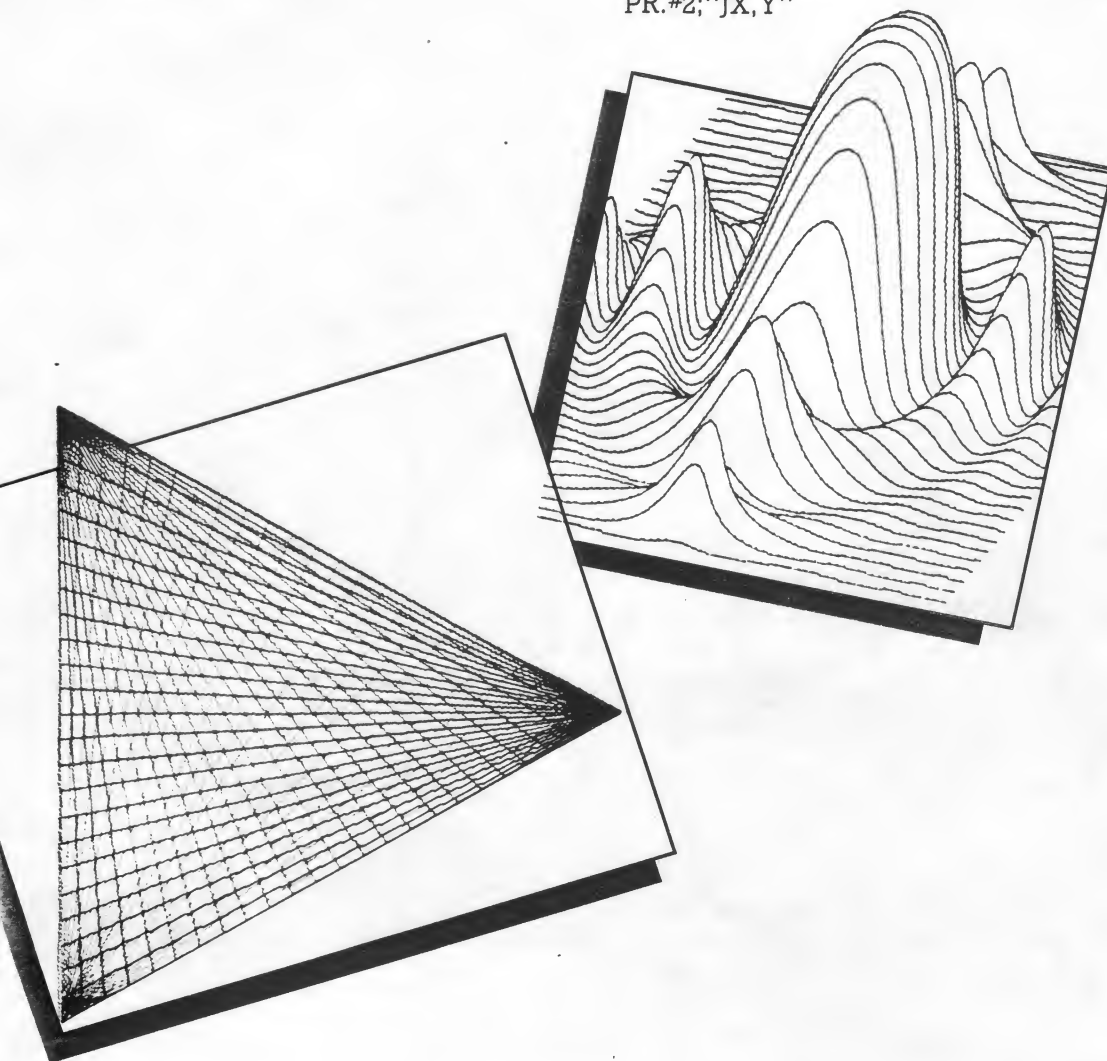
Like a DRAW operation preceded by an INITIALIZE command, the RELATIVE DRAW operation begins from the current position of the pen. To carry out the RELATIVE DRAW operation, type:

PR.#2;"JX,Y"

MOVE

The MOVE command is similar to the DRAW command, except that the pen is raised while the pen carriage travels to the X and Y coordinates that you specify. To command the printer to MOVE, type:

PR.#2;"MX,Y"



OPERATIONS WITHIN THE GRAPHICS MODE

RELATIVE MOVE

RELATIVE MOVE acts in the same way as RELATIVE DRAW, except that the pen is raised while traveling to the new coordinates. To carry out the RELATIVE MOVE operation, type:

PR.#2;"RX,Y"

By using a number of commands together, you can have the printer move to various positions on the paper and draw horizontal, vertical and curved lines or text characters.

AXIS DRAWING

This operation lets you draw X and Y axes; it also lets you determine where scale marks should be printed along the axes and the distance between scale marks. For example:

PR.#2;"X2,11,53"

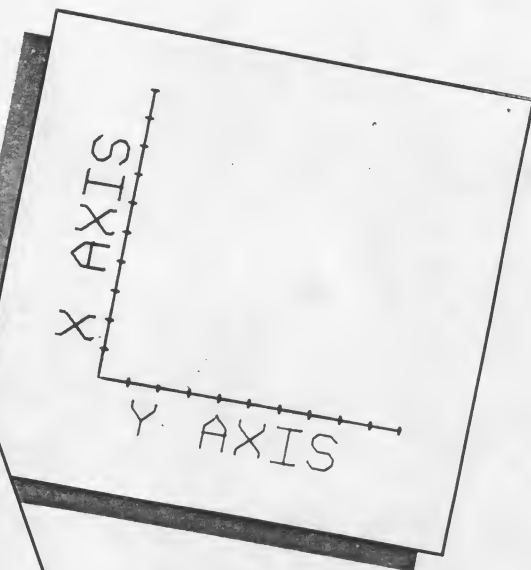
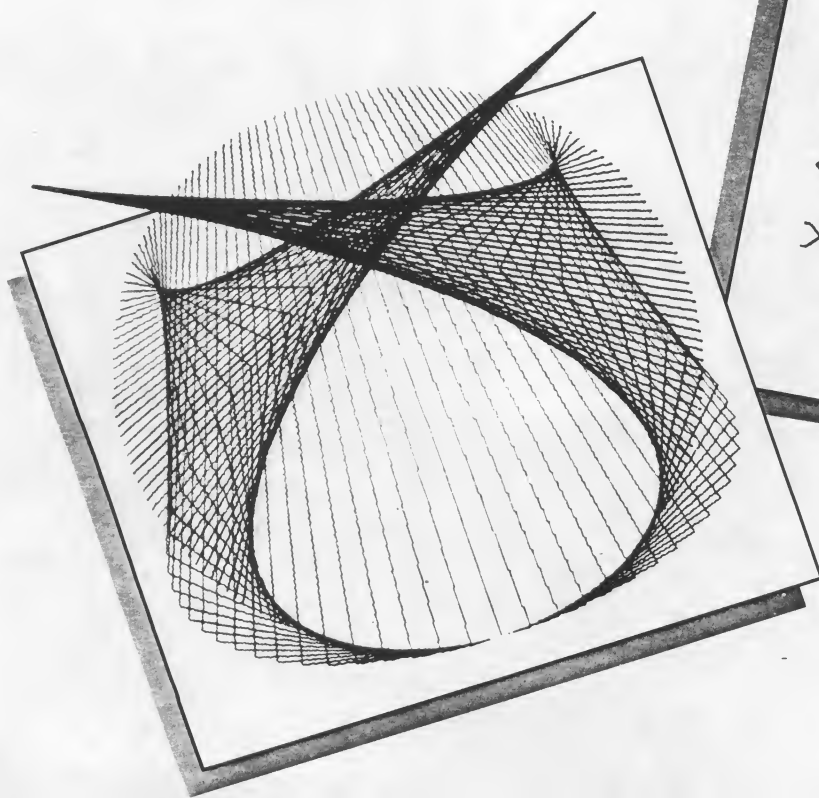
— specifies the
number of scale
marks

— specifies the
distance between
scale marks

— specifies the
X axis

To print the Y axis only, type the number 0 after the X command character. Any number other than 0 will tell the printer to print the X axis. For example, the command PR.#2;"X0,50,10" will print the Y axis with the specified scale marks.

The X and Y axis commands must be entered on separate lines.



ALPHA ROTATE

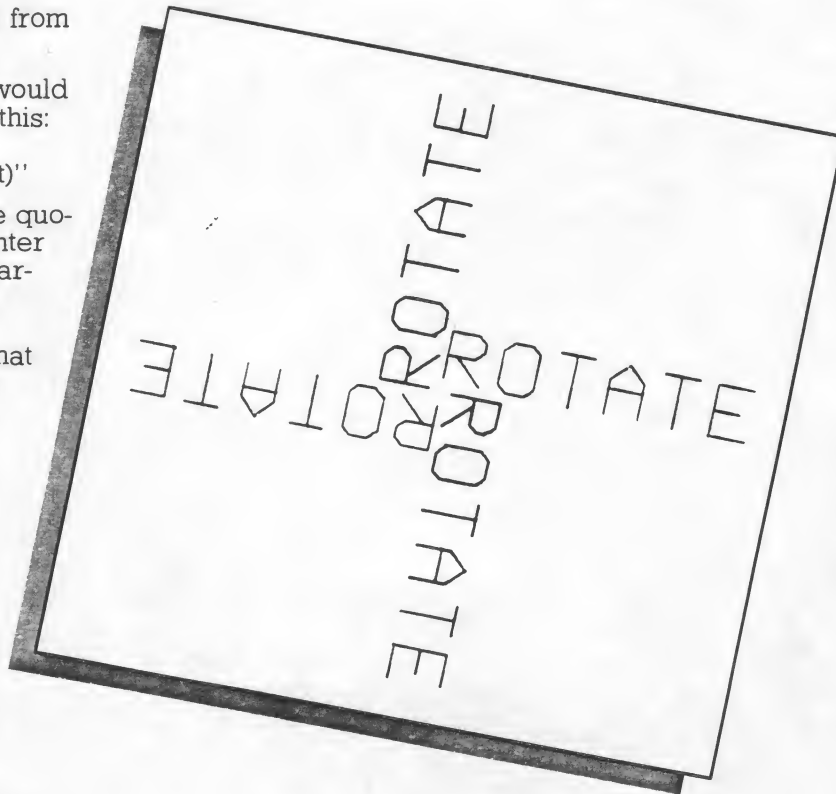
The ATARI 1020 Color Printer can print text characters in four different directions—a handy option for clearly labeling different axes or areas on your charts or graphs. To carry out this operation, type:

PR.#2;"Q(and a value from 0 to 3)"

Then enter the text you would like to have printed like this:

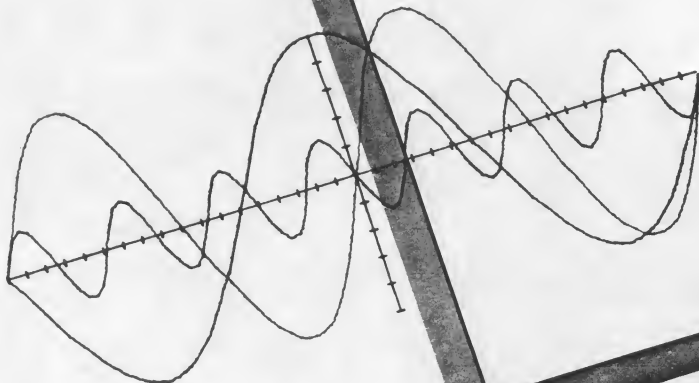
PR.#2;"P(and any text)"

The P command after the quotation marks tells the printer to print alphanumeric characters in the GRAPHICS mode. Your text will be printed in the direction that corresponds to the value you selected.



SAMPLE PROGRAMS

```
10 DIM P(360,3):DEG
20 FOR X=0 TO 360 STEP 4
30 P(X,1)=INT(100*SIN(X*2))
40 P(X,2)=INT(30*SIN(X*7))
50 P(X,3)=INT(100*SIN(X*1.5))
60 NEXT X
70 OPEN #1,8,0,"P:"
80 ? #1;CHR$(27);CHR$(7)
90 FOR Z=1 TO 3
100 ? #1;"C";Z;"*M";0;"",";P(1,Z)-50
110 FOR X=0 TO 360 STEP 4
120 ? #1;"D";X*1.3+0;"",";P(X,Z)-50
130 NEXT X:NEXT Z
140 ? #1;"C0*M00,-50*X1,13,36"
150 ? #1;"M234,-150*X0,20,10"
160 ? #1;"M0,-800"
170 CLOSE #1
180 END
```

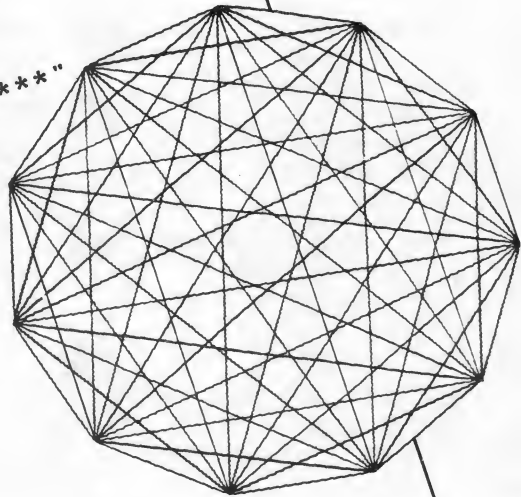


— SINE AND COSINE CURVES —


```

10 DIM D(11,2)
20 OPEN #2,8,0,"P:"
30 PRINT #2;CHR$(27);CHR$(7):PRINT #2;"C0"
40 PRINT #2;"P" ***** PLOTTING ABILITY *****
50 PRINT #2;"H":PRINT #2;"M240,-200"
60 PRINT #2;"I":PRINT #2;"C0"
70 FOR I=0 TO 10:S=I*3.14159265/5.5
80 D(I,0)=SIN(S)*110
90 D(I,1)=COS(S)*110
100 NEXT I
110 C=2
120 PRINT #2;"M";D(0,0);", ";D(0,1)
130 FOR I=1 TO 5
140 C=C+1:IF C>3 THEN C=0
150 PRINT #2;"C";C:K=0
160 FOR J=1 TO 11
170 K=K+1:IF K>10 THEN K=K-11
180 PRINT #2;"D";D(K,0);", ";D(K,1)
190 NEXT J
200 NEXT I
210 PRINT #2;"H"
220 PRINT #2;"M0,-240"
230 PRINT #2;"A"
240 CLOSE #2
250 END

```



***** PLOTTING ABILITY *****

TROUBLESHOOTING

Here's a list of procedures to follow should you have problems using your printer. For help with other problems or questions, you can call ATARI Customer Service toll-free at (800) 538-8543 ((800) 672-1404 in California).

Q What should I do if my printer doesn't automatically run the four-square test pattern when turned on?

A Check to see if the Power-On light is lit. Then check to see if the power cord is plugged securely into both the wall socket and the printer.

Q The printing is coming out light and fuzzy. What's wrong?

A The pens probably need changing. Refer to the CHANGING THE PENS section in this guide.

Q I want to print some large scaled letters. Why, when I enter the command PR.#2;"S45", does the printer type S45?

A You're still operating in the TEXT mode. You must go into the GRAPHICS mode, then enter the SET SCALE command. After you've done this, type PR.#2;"A" to return to the TEXT mode. Your text will now be printed in the size you select.

Q I entered this DRAW command in the GRAPHICS mode:

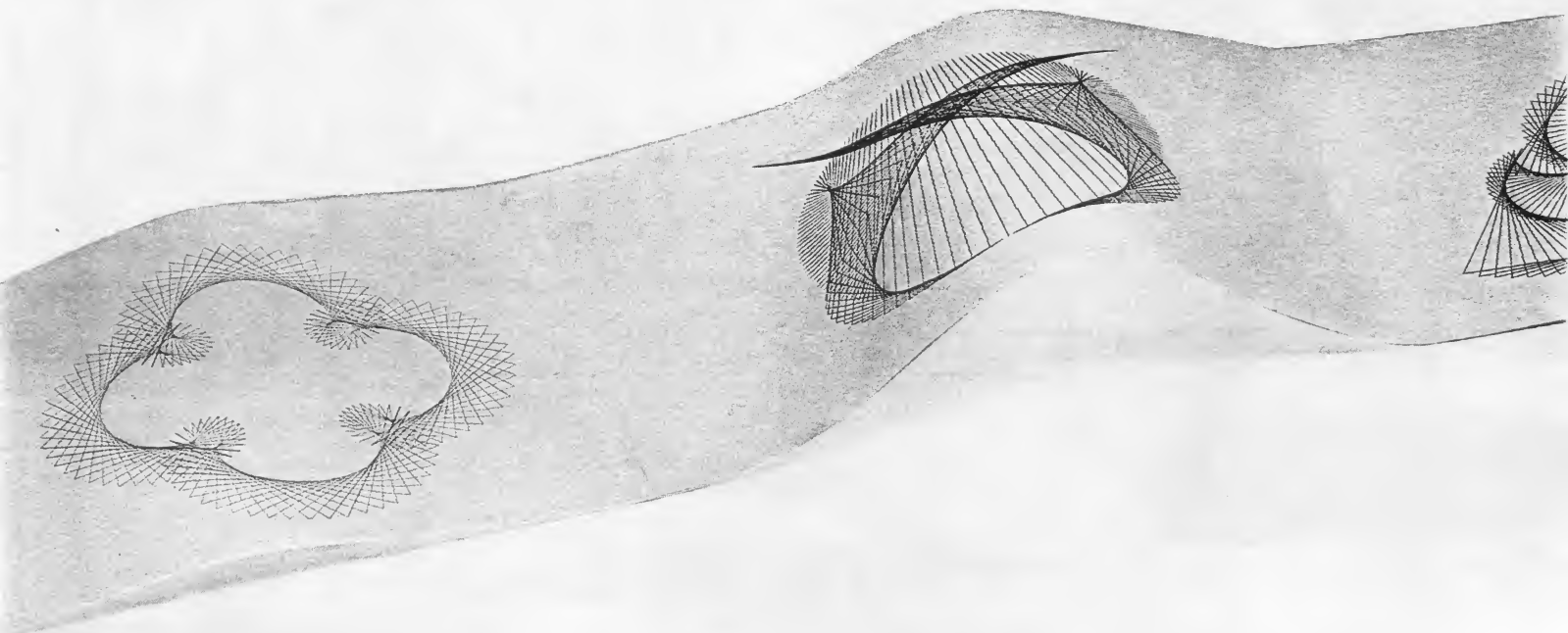
PR.#2;"D240,240:M0,0:D50,280"

Why did the printer draw the first command and ignore the rest?

A You can enter a string of commands using different features only by separating successive commands with an asterisk (*). Type:

PR. #2; "D240,240*M0,0*D50,280"

Now the printer will execute the three commands consecutively.



Every effort has been made to ensure the accuracy of the product documentation in this manual. However, because Atari, Inc. is constantly improving and updating the computer software and hardware, we are unable to guarantee the accuracy of the printed material after the date of publication and disclaim liability for changes, errors or omissions.

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Important Information: Like any electrical appliance, this ATARI Home Computer equipment uses and produces radio frequency energy. If it's not installed and used properly according to the instructions in this guide, the equipment may cause interference with your radio and television reception.

It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of the FCC rules. These rules are designed to provide reasonable protection against such interference when the equipment is used in a residential setting. However, there is no guarantee that interference will not occur in a particular home or residence.

If you believe this equipment is causing interference with your television reception, try turning the equipment off and on. If the interference problem stops when the equipment is turned off, then the equipment is probably causing the interference. With the equipment turned on, you may be able to correct the problem by trying one or more of the following measures:

- Reorient the radio or television antenna.
- Reposition the equipment in relation to the radio or television set.
- Move the equipment away from the radio or television.
- Plug the equipment into a different wall outlet so the equipment and the radio or television are on different branch circuits.

If necessary, consult your ATARI Computer retailer or an experienced radio-television technician for additional suggestions.

